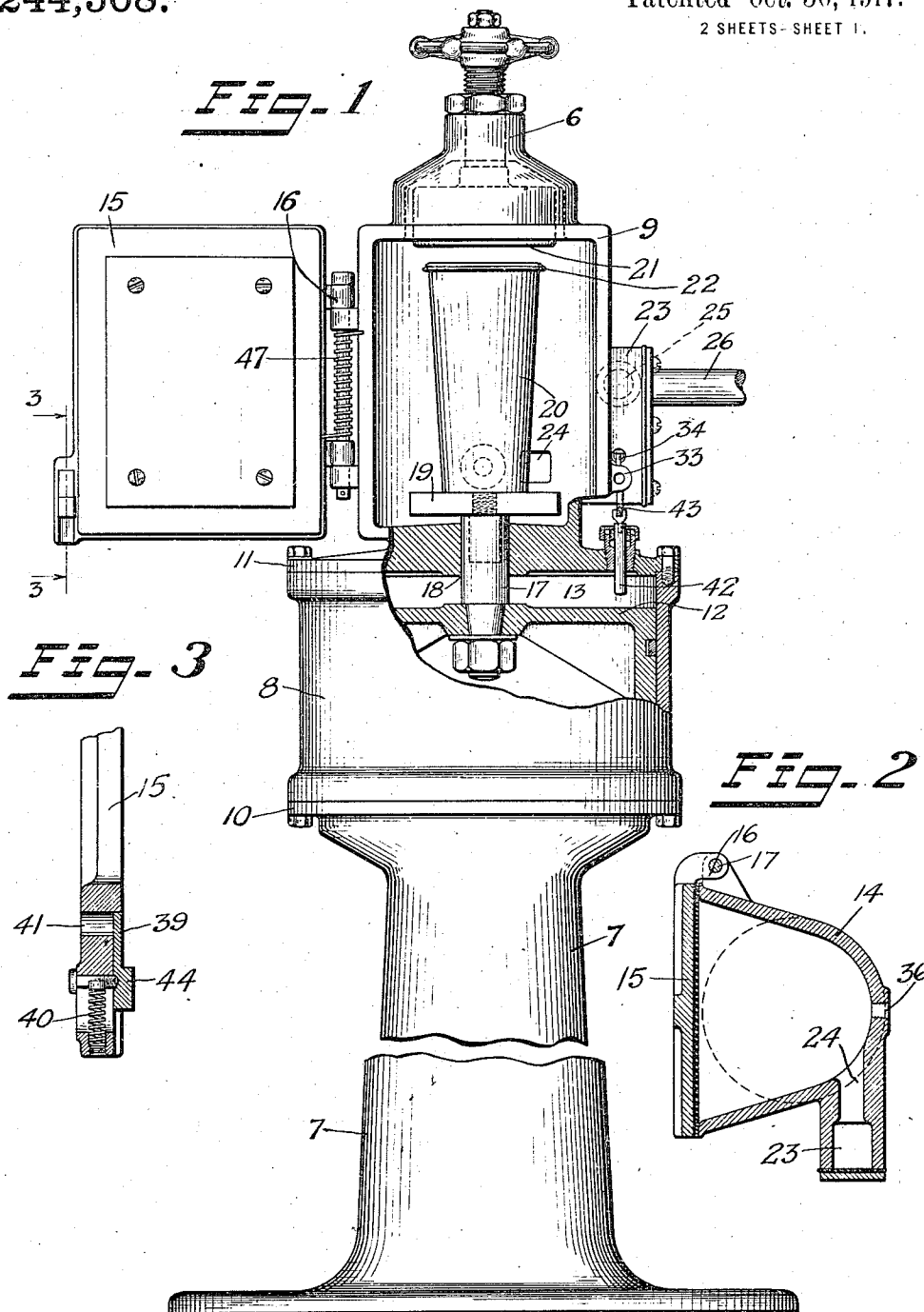


E. B. KRAMER & C. HAMMER.
VACUUM SEALING MACHINE.
APPLICATION FILED JULY 17, 1915.

1,244,508.

Patented Oct. 30, 1917.

2 SHEETS-SHEET 1.



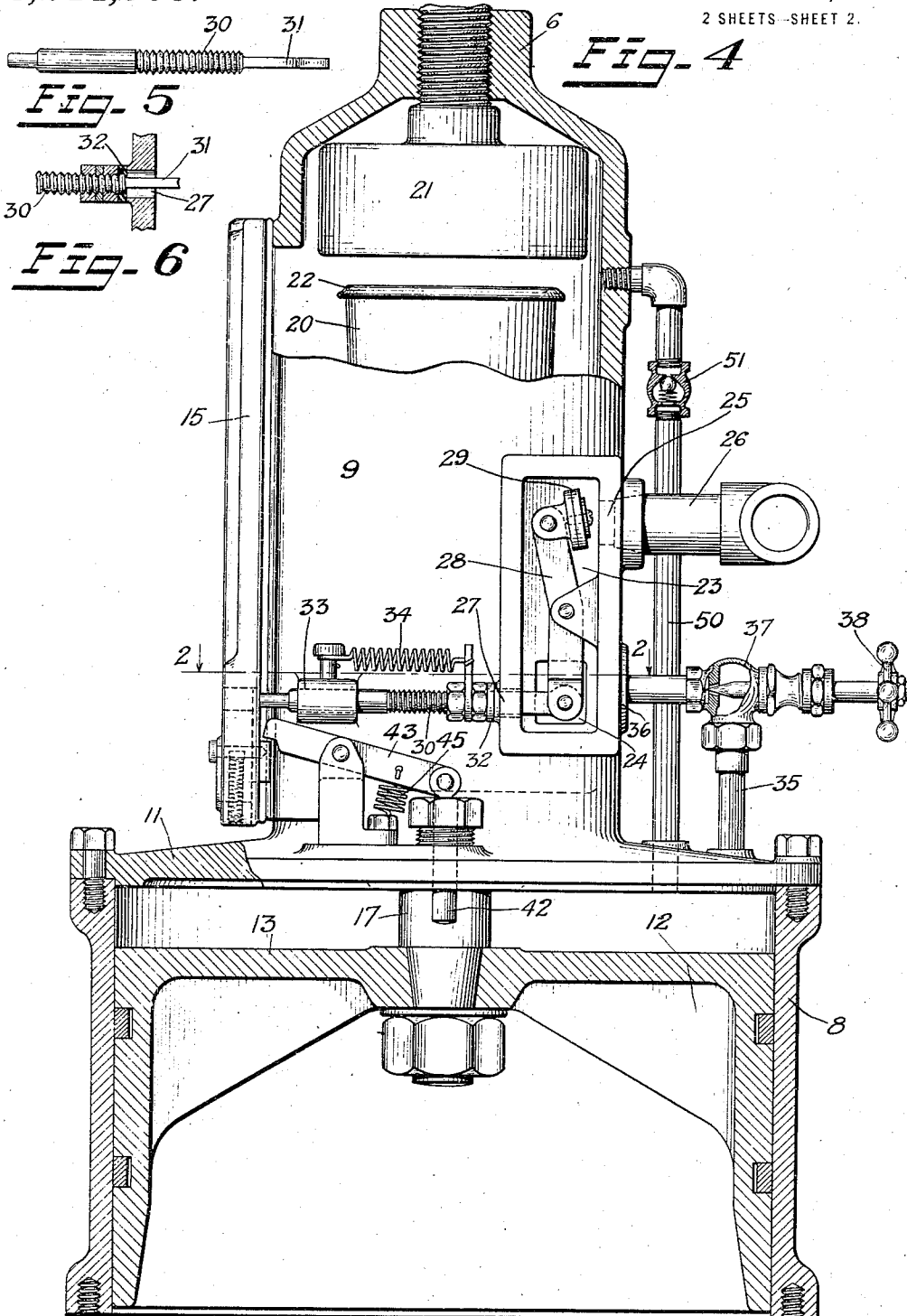
E. B. Kramer,
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2 SHEETS—SHEET 2.



Eric B. Kramer,
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UNITED STATES PATENT OFFICE.

ERIC B. KRAMER, OF BROOKLYN, AND CHARLES HAMMER, OF NEW YORK, N. Y.,
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CO., OF BROOKLYN, NEW YORK.

VACUUM-SEALING MACHINE.

1,244,508.

Specification of Letters Patent.

Patented Oct. 30, 1917.

Application filed July 17, 1915. Serial No. 40,390.

To all whom it may concern:

Be it known that we, ERIC B. KRAMER, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, and CHARLES HAMMER, a citizen of the United States, and a resident of Queens, county of Queens, State of New York, have invented certain new and useful Improvements in Vacuum-Sealing Machines, of which the following is a specification.

This invention relates to an apparatus that operates automatically, when a jar and a cover are placed in the closet, whereby the air is exhausted from the closet, and out of the jar and thereupon the cover is caused to be rigidly secured on the top of the jar, while the vacuum is still maintained.

One object of the present invention is to provide an improved apparatus of the character set forth, wherein, upon placing the jar and cover in the closet of the device, and merely closing the door, the closet is automatically exhausted, and thereupon force is exerted on the jar to tightly secure the lid on top of the jar, during the maintenance of the vacuum; and at the conclusion of such operation, the vacuum is relieved and the door released for opening.

Another object is to provide a form of separate valves in the closet for controlling the exhaust and air ports.

A further object of the invention is to provide in a device of the character set forth, pressure-exerting means operative to seal the lid on the jar; that is operated and controlled by vacuum and air pressure, the exhaust being effected through a restricted passage connecting with the closet in which the jar is subject to the vacuum; and which passage may be controlled by a suitable restricting device which is adjustable to thereby control the operation of the lid-sealing member.

In the accompanying drawings illustrating one embodiment of our invention, Figure 1 shows the apparatus with the door of the closet open, and certain portions in section. Fig. 2 is a horizontal section through the closet on the line 2-2 of Fig. 4. Fig. 3 is a vertical section through the door slide, on the line 3-3 of Fig. 1. Fig. 4 is a vertical section enlarged of the upper portion of the apparatus, partly in elevation, the view being taken at a right angle to that shown

in Fig. 1. Fig. 5 is a plan view of the valve-controlling slide; and Fig. 6 is a vertical section through the middle portion of the slide, showing the valve, and the valve seat of the closet.

As shown in the drawings, the apparatus comprises essentially three portions, a base 7, a cylinder 8 secured to the base, and a closet 9 mounted on top of the cylinder. The cylinder 8 comprises a cylindrical shell whose lower end is supported by a flange 10 on the base 7, leaving the lower end of the cylinder open and exposed to the atmosphere. On top of the cylindrical portion 8 rests the circular plate or disk 11 that as shown is an integral base portion of the closet 9.

In the cylinder 8 reciprocates a piston 12 of the trunk type, formed of a head 13 from which projects the side portion. The lower portion of the piston is hence exposed to atmospheric pressure, while the upper face of the piston head 13 is subject to the pressure of the air in the upper portion of the cylinder 8.

The closet 9, above its base 11 has somewhat U-shaped side walls 14 on three sides, the fourth side being open as indicated in Figs. 1 and 2, to be closed by a swinging door 15 suitably hinged to the side wall 14 at 16. As shown a coil spring 47 on the hinge rod serves to swing the door to the open position when it is free to move, by release of the vacuum in the closet that acts to hold the door shut.

A rod 17 projects upward from the piston head 13, through an aperture 18 in the base 11, into the closet 9, and has secured at its upper end a plunger 19, for supporting a jar 20, as shown in Fig. 1. The upper end of the closet 9 has a closure 6 that is shown as supporting a chuck 21. The latter is adapted to engage the lid 22 of the jar, that is loosely placed thereon when the jar is inserted on the plunger 19. It will be seen that if the cylinder 8 is exhausted above the piston head 13, the piston will be forced upward by atmospheric pressure on its lower face, and the plunger 19 will raise the jar to bring the lid to engage the chuck 21, that will force the lid securely on the jar.

Connected with the closet 9 is a chamber 23, communicating therewith by a passage 24, which chamber is closed except for two

ports. One of these ports 25 connects with a pipe 26 leading to a suitable source of vacuum or exhaust, that in this form of apparatus is operative to continually exhaust the air from the closet through the chamber 23 and passage 24. The chamber 23 also has a port 27 for connecting the closet with the atmospheric air. A valve is arranged to control the air port 27, and a valve is also arranged to control the exhaust port 25; and these valves are preferably connected for simultaneous movement whereby the opening of the exhaust valve will close the air valve, and the opening of the air valve will close the exhaust valve. As shown a lever 28 is pivotally mounted in the chamber 23 and carries a valve 29 serving to close the exhaust port 25. The other end of lever 28 is pivoted to a rod or slide 30, shown separately in Fig. 5. This slide has a reduced portion 31 projecting through the port 27 and being of much less area than the port, will not retard the flow of the air; as indicated in Fig. 6. The slide 30 carries a valve 32 outside of the chamber 23, that when the slide is advanced will serve to close the port 27, as indicated in Figs. 4 and 6. The slide 30 is guided in a suitable block 33, and is connected with a spring 34 tending to move the slide and lever 28, to cause the valve 29 to close the exhaust port 25, and will move the annular valve 32 away from the port 27. Thus the closet is normally closed at the exhaust port 25, and open to the air through the port 27.

The other extremity of the slide 30 will be held by the spring, with the valves as just described, in position to be engaged by the door 15 when it is moved to the closed position. That is, when the door is fully closed, the slide and lever will be moved to the position shown in Fig. 4, in which the annular valve 32 will close the air port 27, and the exhaust valve 29 will be in the open position. This will cause the exhaustion of the closet 9 through the pipe 26. And when the lever is free, the spring will shift the valve lever to close the exhaust valve 29 and open the air valve 32.

The upper portion of the cylinder 8, above the piston head 13 is connected with the closet by a restricted passage. As shown a pipe 35 leads from the cylinder 8 and connects with the closet at 36, see Fig. 2. In this pipe 35 is arranged a suitable adjustable restricting member, such as a needle valve 37 controlled by handle 38. When the door has been closed and the exhaust valve opened, the reduced pressure in the closet will exhaust the air in the cylinder above the piston head 13, through the pipe 35, which operation will be governed by the needle valve. This will permit reduction of pressure in the closet more quickly than that in the cylinder, and the closet will

be quickly exhausted while at a later period the cylinder will be exhausted to permit the piston to rise by atmospheric pressure on its lower face. Therefore the closet will be completely exhausted before the piston has had time to move upwardly and cause the sealing of the lid, by the plunger forcing the jar and lid against the chuck. When subsequently the closet is connected with the outside air, the pressure will be slowly restored in the cylinder by reason of the restriction, and the piston will have a sluggish fall to return the plunger to the bottom of the closet by retarded movement.

When the door was closed to cause the exhaustion of the closet, the atmospheric pressure on the door held it very strongly in the closed position, as long as the exhaust valve remained open. Means are therefore provided for opening the exhaust valve when the piston rises sufficiently to effect the sealing of the jar lid, whereby the door will be released and will automatically swing open by its spring 47. As shown we provide a blade 39 in the door whose upper end is held by a spring 40 normally opposite a cavity 41 in the door. This cavity is in position to register with the extremity of the slide 30 when the door is closed, but the blade in normal position will cover the cavity and serve to engage the slide to swing the valve lever 28, as described. When the piston head 13 reaches its uppermost position for sealing the lid on the jar, it will engage a rod 42 connected with a swinging lever 43 mounted on the base 11. The other extremity of this lever when swung will engage a projection 44 on the blade 39 and move the blade downward away from engagement with the slide 30. Hence the spring 34 will move the slide 30 now released from the blade 39, into the cavity 41, which operation will swing the lever 28 to close the exhaust valve 29 and open the air port 27. This will admit the air to the closet and hence release the door 15, to swing to open position. A spring 45 serves to retract the lever 43 when released from the piston head 13.

In the operation of the device, it is only necessary to insert the jar with the lid placed loosely thereon or else held in the chuck 21; and to move the door to the closed position. The blade 39 on the door will engage the slide 30 and swing the valve lever to close the air port 27 and open the exhaust port 25. The air will be at once exhausted from the closet, and more slowly from the cylinder 8 above the piston. This will cause the piston 12 to rise from the atmospheric pressure on its lower face, and the jar will be carried up until its lid strikes the chuck, that will seal it on the jar. At this period the piston head 13 will swing the lever 43 to shift the blade

39 on the door, and the latter will release the slide 30, to permit its spring to close the exhaust valve and open the air valve. This will free the door to open, and will relieve the vacuum in the cylinder permitting the piston to slowly descend to normal position. The timing of the movement of the piston can be very nicely regulated by the valve 38, to insure the piston rising after a sufficient period to properly exhaust the closet.

If a quick return of the piston 12 is desired, a pipe 50 connects the cylinder with the closet 9, that is normally closed by a check valve 51, which can open to permit quick admission of air to the cylinder 8.

It will be observed from Fig. 4 that two distinctive separate valves control the exhaust and the air ports respectively for the closet. These valves are rigidly connected and have simultaneous movement with opposite effects, that is, the closing movement of one valve takes place at the same time as the opening movement of the other valve, and vice versa. When the lever 28 and slide 30 move in one direction, as by the closing of the door, the exhaust valve that is normally held closed by the spring 34, is now moved to the open position. This movement of the rod 30 will bring the valve 32 to the closed position from its normal open position. It will be understood that the exhaust valve 29 that is held closed by the spring 34, will also be held closed by atmospheric pressure by reason of the exhaust in its port. And when the valve 32 has been closed and a vacuum is established in the chamber 23, this valve will be held closed to a certain extent by the atmospheric pressure; although in fact it is held closed by the door and the block thereon with the spring 34 under tension.

It will be further understood that the opening of the valve 29 will draw the air out of the chamber 23 a short time before the the air valve 32 closes, but the air entering the chamber around the valve 32 will tend to seat this valve at once. And in the reverse movement, when the spring moves the rod 30 and lever 28 to close the valve 29, the air will rush in under the valve 32 when first opened and assist in closing the valve 29, by reason of the exhaust through the port 25.

Having thus described our invention, what we claim is:

1. In a vacuum sealing machine, the combination of a closet provided with an exhaust port and an air port, means for controlling said ports to alternately exhaust the closet and to connect it with atmospheric air, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, and a passage connecting the closet with the cylinder and

provided with restricting means whereby when the closet is exhausted the cylinder will be subjected to a retarded exhaust, to cause advance of the piston and plunger after the closet has been exhausted.

2. In a vacuum sealing machine, the combination of a closet provided with an exhaust port and an air port, means for controlling said ports to alternately exhaust the closet and to connect it with atmospheric air, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a passage connecting the closet with the cylinder and provided with restricting means whereby when the closet is exhausted the cylinder will be subjected to a retarded exhaust, to cause advance of the piston and plunger after the closet has been exhausted, and means for controlling the air and exhaust ports of the closet from the movement of the piston.

3. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, means arranged to be engaged by the door when closed to shift the valve to open the exhaust port, an air port in the closet, an air port valve connected with the exhaust valve that is opened when the exhaust valve is closed and which is closed when the exhaust valve opens, a restricted passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure, and means arranged to be engaged by said piston at the final part of its said advance whereby to effect the closing of the exhaust valve and opening of the air valve.

4. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, means arranged to be engaged by the door when closed to shift the valve to open the exhaust port, an air port in the closet, an air port valve connected with the exhaust valve that is opened when the exhaust valve is closed and which is closed when the exhaust valve opens, a passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure, means arranged to be engaged by said piston at the final part of its said advance whereby to effect the closing of the exhaust valve and opening of the air valve, and an adjustable restricting valve in said connecting passage.

5. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the
 5 cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, means arranged to be engaged by the door when closed to shift the valve
 10 to open the exhaust port, means to close the exhaust valve when released from the door, an air port in the closet, a valve for the air port connected with said exhaust valve to be opened when the exhaust valve is
 15 closed and which air valve is closed when the exhaust valve is opened, a restricted passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure, and means-actuated by said piston at
 20 the final part of its advance to release the valve member from the door and permit the said exhaust valve closing means to close said valve and open the air valve.

25 6. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the
 30 cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, a slide connected with said valve and arranged to be engaged by the door
 35 when closed to thereby shift the valve to open the exhaust port, a spring to retract said slide when released from the door and thus close the valve, an air port in the closet, a valve on said slide for the air port that is
 40 opened when the exhaust valve is closed and which is closed when the door shifts the slide to open the exhaust valve, a blade movably carried by the door and normally held in position to operate said slide on closing
 45 of the door, a restricted passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure when the closet is exhausted, a lever adapted to engage said
 50 blade to shift it out of position of engagement with the valve slide to free the slide from control by the door, and a connection on said lever adapted to be engaged by said
 55 piston at the final part of its said advance, whereby the lever will free the plate from said slide and permit the slide to be shifted by its spring to close the exhaust valve and open the air valve.

7. In a vacuum sealing machine, the combination of a closet provided with a door to
 60 close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve in the closet con-
 65 trolling the exhaust port, a slide projecting through an aperture in the closet and connected with said valve to control the valve,

an annular valve on said slide adapted to close the said opening when the slide is advanced to open the exhaust valve, said slide
 70 being arranged to be engaged by the door when closed and shifted to close the annular valve and open the exhaust valve, a spring arranged to operate said slide to close the
 75 exhaust valve and open the air valve, a restricted passage connecting the cylinder and closet to exhaust the cylinder through the closet upon closing of the door whereby to advance the piston and plunger, and means
 80 connected with the piston to release said slide from the closed door to permit the slide to close the exhaust valve and open said annular valve at the final advance of the piston.

8. In a vacuum sealing machine, the combination of a closet provided with a door to
 85 close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an
 90 exhaust device, a valve in the closet controlling the exhaust port, a slide projecting through an aperture in the closet and connected with said valve to control the valve,
 95 an annular valve on said slide adapted to close the said opening when the slide is advanced to open the exhaust valve, said slide being arranged to be engaged by the door
 100 when closed and shifted to close the annular valve and open the exhaust valve, a spring arranged to close the exhaust valve and open the air valve, a restricted passage connecting the cylinder and closet to exhaust the cylinder
 105 through the closet upon closing of the door whereby to advance the piston and plunger, a blade carried by the door normally in position to engage said slide, a lever arranged to engage said blade to shift it from normal position, and a rod project-
 110 ing from the cylinder and connected with said lever, said rod being adapted to be engaged by the piston at the final portion of its advance movement to swing the lever and shift the blade, and thereby release the slide
 115 to close the exhaust valve and open the air valve.

9. In a vacuum sealing closet, a port for connection with an exhaust, a puppet valve arranged to close such port, an air inlet
 120 port, a separate puppet valve arranged to close the air port, and a member connecting said valves whereby when the member is moved in one direction it will first open the
 125 exhaust valve and upon further movement will close the air valve and upon reverse movement of the member it will first open the exhaust valve and upon further movement will close the air valve, said exhaust
 130 valve when closed being pressed against its seat by atmospheric pressure.

10. In a vacuum sealing closet, a port for connection with an exhaust, a valve arranged to close such port, an air inlet port, a separate valve arranged to close the air port, and a member connecting said valves whereby when the member is moved in one direction it will first open the exhaust valve and upon further movement will close the air valve and upon reverse movement of the member it will first open the exhaust valve and upon further movement will close the air valve, said air valve when closed being pressed against its seat by atmospheric pressure.

11. In a vacuum sealing closet, a port for connection with an exhaust, a valve arranged to close such port, an air inlet port, a separate valve arranged to close the air port, and a member connecting said valves whereby when the member is moved in one direction it will first open the exhaust valve and upon further movement will close the air valve and upon reverse movement of the member it will first open the exhaust valve and upon further movement will close the air valve, a spring attached to the valve operating member to move it to close the exhaust valve and open the air valve, a door arranged to close the closet, and means arranged to cause the closing of the door to shift the valve member against the force of said spring to first open the exhaust valve and at the final closing movement to close the air valve.

12. In a vacuum sealing closet, a port connected with an exhaust, a lever pivotally mounted in the closet, a valve on the lever to close said port and which is held closed by the exhaust action, an air port in the closet, a rod projecting through said port and connected with said lever, an annular valve on said rod arranged to close the said port when the lever is moved to open the exhaust valve, and which is closed when the exhaust valve is open.

13. In a vacuum sealing closet, a port connected with an exhaust, a lever pivotally mounted in the closet, a valve on the lever to close said port and which is held closed by the exhaust action, an air port in the closet, a rod projecting through said port and connected with said lever, an annular valve on said rod arranged to close the said port when the lever is moved to open the exhaust valve, and which is closed when the exhaust valve is open, a spring connected with said rod arranged to shift the rod and lever to open the air valve and close the exhaust valve, a door on the closet arranged to engage said rod when the door is closed to first open the exhaust valve and at the final closing movement to close the air valve.

14. In a vacuum sealing machine, the combination of a closet provided with an exhaust port and an air port, means for con-

trolling said ports to alternately exhaust the closet and to admit atmospheric air, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a passage connecting the closet with the cylinder and provided with restricting means whereby when the closet is exhausted the cylinder will be subjected to a retarded exhaust, to cause advance of the piston and plunger after the closet has been exhausted, a conduit providing free passage between the closet and the cylinder, and a check-valve to prevent return passage there-through from the cylinder to the closet.

15. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, means arranged to be engaged by the door when closed to shift the valve to open the exhaust port, an air port in the closet, an air port valve connected with the exhaust valve that is opened when the exhaust valve is closed and which is closed when the exhaust valve opens, a passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure, means arranged to be engaged by said piston at the final part of its said advance whereby to effect the closing of the exhaust valve and opening of the air valve, a conduit providing free passage between the closet and the cylinder, and a check-valve to prevent return passage therethrough from the cylinder to the closet.

16. In a vacuum sealing machine, the combination of a closet provided with a door to close the same, a plunger slidable in the closet, a cylinder, a piston slidable in the cylinder and connected with the plunger, a port in the closet for connection with an exhaust device, a valve arranged to control said port, means arranged to be engaged by the door when closed to shift the valve to open the exhaust port, an air port in the closet, an air port valve connected with the exhaust valve that is opened when the exhaust valve is closed and which is closed when the exhaust valve opens, a passage connecting the closet with the cylinder to exhaust the cylinder and cause advance of the piston and plunger by air pressure, means arranged to be engaged by said piston at the final part of its said advance whereby to effect the closing of the exhaust valve and opening of the air valve, an adjustable restricting valve in said connecting passage, a conduit providing free passage between the closet and the cylinder, and a check-valve to prevent return passage therethrough from the cylinder to the closet.

17. In a vacuum sealing machine, a seal-

ing closet provided with a closed chamber therein having an air port connecting with the closet, a second port in the chamber connecting with an exhaust, a valve working
 5 in the chamber to control the exhaust port, a valve operating in the said port connecting with the closet and operably connected with the air port valve from the outside of the chamber, said valves being connected where-
 10 by when the air valve is closed the exhaust valve is opened and when the exhaust valve closes the air valve opens, a door arranged to close the closet, and means connected with the valves to normally retain the exhaust
 15 valve closed and the air valve open, which means on closing the door is engaged to close the air valve and open the exhaust valve.

18. In a vacuum sealing closet, a port for connection with an exhaust, a puppet valve
 20 arranged to close said port, an air inlet port, a separate puppet valve pivoted to said valve and arranged to close the air port, and a member connecting said valves said parts being arranged whereby when said member is
 25 moved in one direction it will first open the exhaust valve, and upon further movement of the member it will close the air valve, and upon retraction of the member it will first open the exhaust valve and thereupon close
 30 the air valve.

19. In a vacuum sealing machine, a seal-

ing closet provided with a closed chamber therein having an air port connecting with the closet, a second port in the chamber connecting with an exhaust, a valve working in
 35 the chamber to control the exhaust port, a valve separate from said valve and operated in the said port connecting with the closet and pivotally connected with the air port valve from the outside of the chamber, said
 40 valves being connected whereby when the air valve is closed the exhaust valve is opened and when the exhaust valve closes the air valve opens.

20. In a vacuum sealing machine, the combination of a closet provided with an exhaust
 45 port and air port, means for controlling said ports to alternately exhaust the closet and to connect it with atmospheric air, a plunger slidable in the closet, a cylinder, a piston
 50 slidable in the cylinder and connected with the plunger, a passage connecting the closet with the cylinder whereby when the closet is exhausted the cylinder will be subjected to an exhaust, to cause advance of the piston
 55 and plunger after the closet has been exhausted and valve means for controlling the air and exhaust ports of the closet directly actuated from the movement of the piston.

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